APHIS SALICETI (KALTENBACH), SIPHOCORYNE PASTINACÆ (LINN.), AND ALLIED SPECIES.

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It is the object of the authors of this paper to give the results of their studies on a half dozen species of aphides that are quite similar in general appearance, and all but one of which have the willows for their winter hosts, in the hope that they will clear away some confusion and prevent further mixing of data. We believe we have the structural characteristics and food habits well enough worked out so that these species may be readily separated, whether from their winter or summer hosts, by use of the following simple key:

Cornicles cylindrical or slightly tapering.

Pré-caudal spine on dorsum of 8th abdominal segment.....*Aphis theobaldi*, n. sp.

No pre-caudal spine on 8th abdominal segment..*Aphis saliceti*.

Cornicles distinctly clavate.

With pre-caudal spine on 8th abdominal segment,

Joints 4, 5, 6 and spur sub-equal.....*Siphocoryne capreæ*.

Spur equal to joints 4, 5 and 6 combined.....*Siphocoryne essigi*, n. sp.

Without pre-caudal spine on 8th abdominal segment,

Antenna shorter than the body.....*Siphocoryne pastinacæ*.

Antenna longer than the body.....*Siphocoryne grabhami*.

In order that others interested in these species may look up the literature readily, we are giving references to the more important papers:

Aphis saliceti Kaltenbach.

Aphis saliceti, Monographie der Fam. der Pflanzenläuse, p. 103, 1843.

Koch, Die Pflanzenläuse, p. 118, 1857.

Buckton, Monograph of British Aphides, vol. II, p. 52, 1879.

Siphonophora salicicola, n. sp., Thomas, Bul. 2, III, St. Lab. Nat. Hist., p. 8, 1878.

Aphis salicicola, Monell, Bul. 5, U. S. Geol. Surv., p. 24, 1879.

Oestlund, Aphididæ of Minn., p. 63, 1887.

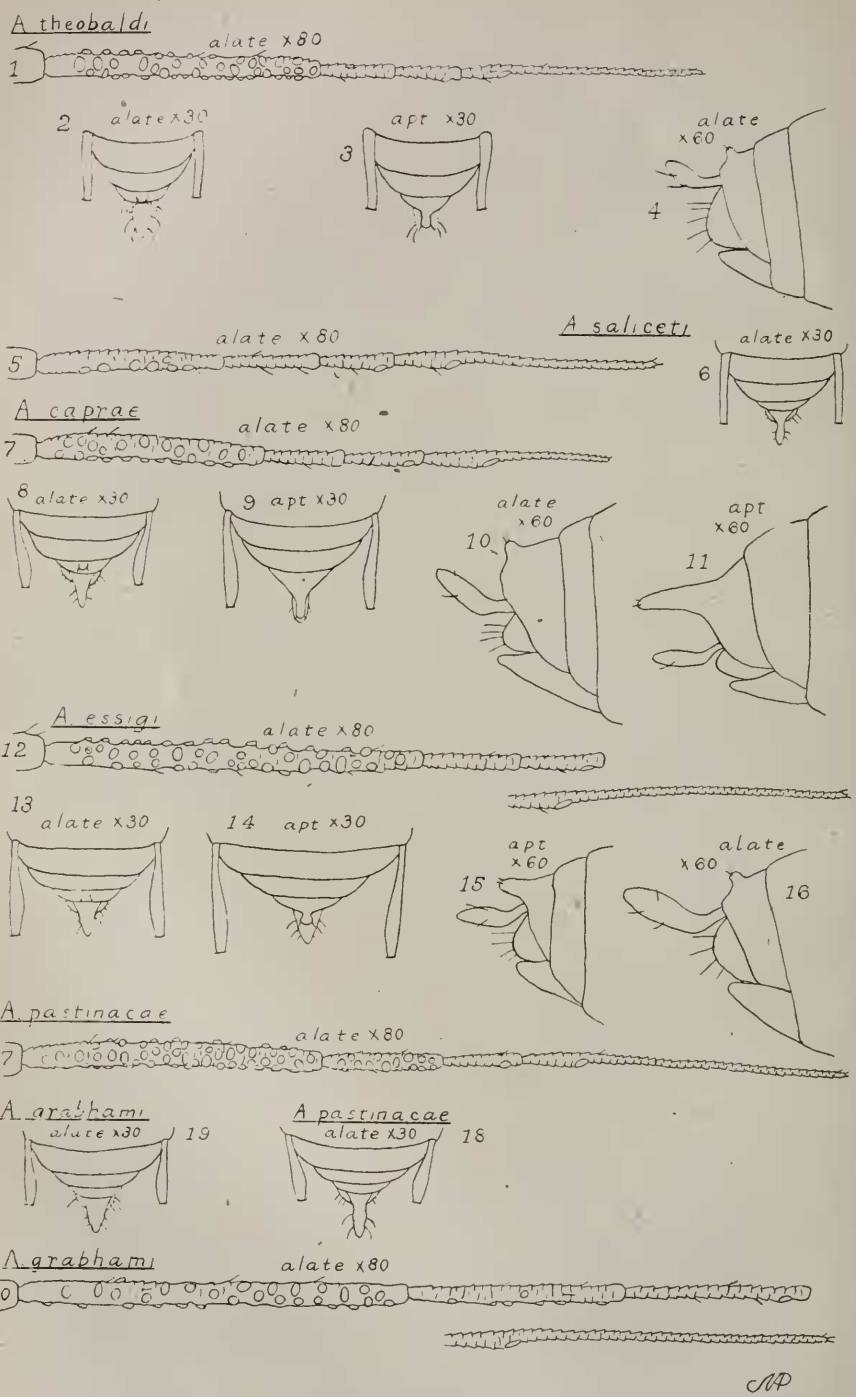

Figure 1—4, *Aphis theobaldi*; 5—6, *A. saliceti*; 7—11, *Siphocoryne capreae*; 12—16, *S. essigi*, n. sp.; 17—18, *S. pastinacae*; 19—20, *S. grabhami*. Original, Miriam A. Palmer Delineator.

Aphis salicola, Cowen, Hemip. of Colo., Bul. 31, p. 121, 1895.
Morgan, Jour. Exp. Zool., vol. VII, p. 301, 1909.
Aphis salicicola, Davis, Jour. Ec. Ent., vol. 3, p. 490, 1910.
Williams, Aphididæ of Neb., Univ. Studies, vol. 10, No. 2, p. 55, 1910.
Aphis saliceti, Theobald, Rep. on Ec. Ent. for 1912, p. 84 (*theobaldi*).
Aphis salicicola, Davidson, Jour. Ec. Ent., vol. 5, p. 408, 1912.
Patch, Bul. 213, Me. Exp. Sta., p. 81, 1913.
Siphocoryne saliceti, Borner, Blattlausstudien, in Abhand, Naturwiss. Ver. Bremen, XXIII, pt. I, p. 164, 1914.
Aphis saliceti, Van der Goot, Beiträge zur Kenntnis der Holländischen Blattläuse, p. 225, 1915.

The *salicicola* of Thomas is undoubtedly a synonym of *saliceti* Kaltenbach, and the cases where the specific name is given as "*salicola*" are errors in spelling, Cowen being the first offender, and others following.

This species is of special interest because of the cytological work done upon it by Dr. N. M. Stevens and Dr. T. H. Morgan. We happen to know this is the species that was worked with as specimens were submitted to us by Dr. Morgan for identification. It differs from the others mentioned in this paper in its habit of remaining upon the willows throughout the year, and seems not to have an alternate summer host. It is also peculiar among the aphides, that deposit over-winter eggs, in that the sexual forms appear very early in the summer. We have taken the males and oviparous females at Fort Collins as early as June 20, and the eggs before the end of June. We know no other species approximating it in this respect. Our records for the capture of the sexual forms are as follows:

Woods Hole, Mass., June 29, 1909, L. C. Bragg.
Geneva, N. Y., June 30, 1909, C. P. Gillette.
Fort Collins, Colo., July 14, 1910, L. C. Bragg.
" " " June 17, 1912, L. C. Bragg.
" " " June 20, 1912, L. C. Bragg.
Lansing, Mich., July 12, 1912, C. P. Gillette.
Fort Collins, Colo., July 30, 1912, L. C. Bragg.
Manitou, Colo., June 14, 1917, L. C. Bragg.

We also have viviparous lice in the collection taken as follows:

Russia, 1893, N. Cholodkovsky.

Mass., 1909, T. H. Morgan.

Webster, Mass., June 19, 1909, L. C. Bragg.

Lyons, Colo., June 11, 1916, L. C. Bragg.

Fort Collins, Colo., June 11, 1917, L. C. Bragg.

Dr. Stevens, in her paper, referred to above, states that Kyber, in his paper on "Einige Erfahrungen und Bemerkungen über Blattläuse in Germar's Magazin der Entomologie, 1815, records finding sexual forms of what was, undoubtedly, this species, on willow in June, and she also reports taking the sexuales on June 29 at Harpswell, Maine.

Aphis theobaldi, n. sp.

Aphis saliceti Kalt., Theobald, Rep. on Ec. Ent. for 1912, p. 84.

The presence of the pre-caudal spine, or produced eighth abdominal tergite, and the cylindrical cornicles, are characters that readily separate this species from the others mentioned in this paper. It seems to be the species described and figured by Theobald in his Report on Economic Zoology for 1912, page 84, and Plate XIII, and Figure 24. The species is one having alternate food habits, and may be described from our material as follows:

Alate Viviparous Female.

From specimens mounted in Canada balsam. Head, thorax, antennæ, tarsi and distal ends of tibiæ, black or blackish; abdomen greenish or yellowish; cornicles cylindrical, .28 long, or about as long as the spur of the antennæ and yellowish in colour; cauda barely one-half as long as the cornicles; a short, blunt tubercle on the median line of the 8th abdominal tergite; antennæ nearly reaching the base of the cornicles; 1.13 long; joint III with about 40 strong tuberculate sensoria and longer than joint VI with the spur; spur as long as joints IV, V and VI combined; length of body, 1.50; wing venation normal.

Described from specimens taken at Geneva, N.Y., July 1, 1909.

Apterous Viviparous Female.

From specimens mounted in Canada balsam. Colour, a uniform yellowish brown, probably green or yellowish green in

life; legs, antennæ and cornicles yellow, with tips of antennæ and tarsi black; cornicles yellow and nearly cylindrical, slightly tapering and curved outward at the distal ends; .40 long, or fully as long as joint VI of the antenna with its spur; length of antenna, 1.20; joint III without sensoria; cauda rather broad and spatula-like; or pre-caudal tergite, a somewhat knobbed tubercle, fully half as long as the cauda, projecting directly above it and bearing two prominent hairs; antennæ and legs sparsely set with short, stout, blunt hairs that can hardly be said to be capitate; length of body, 1.60. See figures.

Described from specimens taken along with the alate viviparous females at Geneva, N.Y.

Both alate and apterous forms, in every respect like those described above, were taken at the same place and date on flower heads of *Heracleum* species, and we have also taken it from celery, Webster, Mass., 6, 19, 1909, so there can be little doubt but that this species also alternates between the willows and umbelliferous plants as in the cases of *capreæ* and *essigi*.

Siphocoryne capreæ (Fabricius).

Aphis capreæ, Ent. Syst. Nat., IV, 221, Syst. Ent. 217; Syst. Rhyng., p. 294, 1803.

Kaltenbach, Monographie der Pflanzenläuse, p. 109. 1843.

Rhopalosiphum capreæ, Koch, Die Pflanzenläuse Aphiden, p. 37, figs. 46–47, 1857 (not this species).

Rhopalosiphum cicutæ, Koch, Die Pflanzenläuse, p. 24, 1857.

Rhopalosiphum pastinacæ, Koch, Die Pflanzenläuse Aphiden, p. 41, figs. 52–54, 1857.

Siphocorynæ capreæ, Passerini, Gli Afidi, 1860.

Siphocorynæ pastinacæ, Buckton, British Aphides, vol. II, p. 24, 1879.

Rhopalosiphum salicis, Monell, Bull. 5, U. S. Geol. Surv., p. 26, 1879.

Thomas, 8th Report St. Ent. III, p. 194, 1879.

Siphocoryne salicis, Weed, Trans. Am. Ent. Soc., vol. XX, p. 297, 1893.

Siphocoryne angelicæ, Œstlund, Aphididæ of Minn., p. 70, 1887.
Rhopalosiphum capreæ, Gillette, Jour. Ec. Ent., vol. IV, p. 320, 1911.
Siphocoryne capreæ, Theobald, Rep. Ec. Zool. for 1912, p. 87.
Siphocoryne capreæ, Essig., Univ. of Calif. Tech. Bull., vol. I, No. 7, p. 342, 1917.

Siphocoryne essigi, n. sp.

Hyadaphis pastinacæ, Essig, Pomona Jour. of Ent. 1911, p. 534.

This species which was well described and figured by Essig, differs from *pastinacæ* by having the pre-caudal spine, and from *capreæ* by the long antennal spur and in other ways.

Siphocoryne pastinacæ (Linn.).

Aphis pastinacæ, Fauna Suecica, p. 259, 1761.
Aphis xylostei, Schrank, Fauna Boica, p. 107, 1801.
Aphis pastinacæ, Fabricius, Systema Rhyngotorum, p. 269, 1803.
Siphonophora pastinacæ, Buckton, vol. II, p. 24, 1879 (capreæ).
Hyadaphis pastinacæ, Schouteden, Mém. Soc. Ent. Belgique, p. 229, 1906.
Hyadaphis xylostei, Davis, Jour. Ec. Ent., p. 493, 1910.
Rhopalosiphum pastinacæ, Gillette, Jour. Ec. Ent., pp. 320–322, 1911.
Rhopalosiphum xylostei, Gillette, Jour. Ec. Ent., p. 320, 1911.
Hyadaphis pastinacæ, Essig, Pomona Jour. Ent., p. 534, 1911.
Rhopalosiphum xylostei, Murtfeldt, Jour. Ec. Ent., vol. 4, p. 226, 1911.
Syphocoryne pastinacæ, Theobald, Rep. on Ec. Zoology for 1912, p. 88.
Syphocoryne xylostei, Essig, Univ. of Cal. Tech. Bull., vol. I, No. 7, p. 324, 1917.

While Linnæus took his *pastinacæ* from *Pastinaca sativa*, and Schrank took his *xylostei* from the European honeysuckle, *Lonicera xylosteum*, we now know that the latter food plant is an overwinter host for *pastinacæ*, and, as the descriptions of these species do not differ in any important particular, we believe *xylostei* should be considered a synonym of *pastinacæ*.

Siphocoryne grabhami. Cockerell.

Canadian Entomologist, vol. XXXV, p. 342, 1903.